REMARKS

Applicants have carefully considered the points raised in the Office Action and believe that the Examiner's concerns have been addressed as described herein, thereby placing this case into condition for allowance, which is respectfully requested.

Status of the claims

Claims 1-49 are pending in the present application. Claims 25-27 and 37-41 were previously withdrawn as drawn to a non-elected invention in response to a restriction requirement, and claims 28-36 and 42-48 were withdrawn in response to an election of species requirement. By virtue of this response, claims 50 and 51 have been added. Accordingly, claims 1-51 are currently under consideration.

Support for new claims 51 and 52 may be found, for example, in paragraphs [0051] and [0054] of the specification. No new matter has been added by the foregoing amendments.

Applicants note that upon allowance of a generic claim Applicants will be entitled to consideration of claims to additional species. Applicants reiterate the request that, upon the allowance of a generic claim, the remainder of the species of claims 28-36 and 42-48 be included as permitted under 37 C.F.R. §1.141(a).

With respect to any claim amendments or cancellations, Applicants have not dedicated to the public or abandoned any unclaimed subject matter and moreover have not acquiesced to any objections and/or rejections made by the Patent Office. Applicants expressly reserve the right to pursue prosecution of any presently excluded subject matter or claim embodiments in one or more future continuation and/or divisional application(s).

Request for rejoinder

In response to Applicants' request for rejoinder of withdrawn process claims in the response filed on May 16, 2005, the Examiner states that the election was made without traverse in the reply to the restriction requirement filed on October 12, 2004, Applicants' request for rejoinder

in the response of May 16, 2005 was not timely, and that a request for rejoinder under MPEP §821.04 applies to product-by-process and process claims, not apparatus and process claims. Applicants agree that the election of apparatus claims was made without traverse, but Applicants respectfully disagree with the other statements made by the Examiner in response to the request for rejoinder.

MPEP §821.04 states that "[w]here product and process claims drawn to independent and distinct inventions are presented in the same application, applicant may be called upon under 35 U.S.C. 121 to elect claims to either the product or process. . . .[I]f applicant elects claims directed to the *product*, and a *product* claim is subsequently found allowable, withdrawn *process* claims which depend from or otherwise include all the limitations of the allowable product claim *will be rejoined*." (Emphasis added.) This section of the MPEP is directed to rejoinder of *process* claims (not product-by-process claims, as asserted by the Examiner) that depend from or otherwise include all of the limitations of allowable *product* claims. The withdrawn method (*i.e.*, process) claims in this application are dependent on the elected apparatus (*i.e.*, product) claims, thus satisfying the conditions set forth under MPEP §821.04 for rejoinder upon allowance of the apparatus claims. The MPEP states that under these conditions, the process claims will be rejoined. The Examiner does not have the discretion to deny the Applicants' request for rejoinder if the product claims are allowable and the process claims depend from the product claims.

The Examiner states that the Applicants' request for rejoinder of the withdrawn method claims was not timely, since no arguments or remarks to this effect were made in the response to the restriction requirement filed on May 16, 2005. The MPEP section discussed above does not state a time frame during which a request for rejoinder of non-elected process claims must be made. The MPEP simply states that the non-elected process claims will be rejoined when the elected product claims are found allowable, provided that the withdrawn process claims depend from or otherwise include all of the limitations of the allowable elected product claims. Applicants do not need to make such a request at the time of responding to the original restriction requirement.

The Examiner further states that a complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action in accordance with MPEP §821.01.

Applicants respectfully note that MPEP §821.01 applies to an application in which a restriction requirement has been traversed. Since the election of apparatus claims was made *without* traverse, this MPEP section does not apply to the instant application.

Applicants respectfully reiterate their request for rejoinder of withdrawn method claims upon allowance of the apparatus claims from which they depend.

Rejection under 35 U.S.C. § 103(a)

Claims 1-24 and 49 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over any one of Hamada et al. (U.S. Patent No. 5,609,834), Furuya et al. (JP 6-111838), or Nakamura et al. (JP 6-219703), in view of Hunter et al. (U.S. Patent No. 4,214,867). Applicants respectfully traverse this rejection.

The Examiner states that neither Hamada et al., Furuya et al., nor Nakamura et al. specifically disclose an apparatus that includes at least a portion of a first catalyst-coated surface directly opposite at least a portion of a second catalyst-coated surface on opposing sides of a separator that is shaped to form corrugations, as recited in claim 1 as amended. The Examiner further states that Hunter et al. disclose a method and apparatus for catalytic heat exchange in which a separator is coated with catalyst to form directly opposed surfaces for heat exchange, in which the separator is in the form of a corrugated metal strip or foil, which is advantageous for providing improved catalytic combustion and heat exchange for carrying out simultaneous reactions, and that it would have been obvious to one of ordinary skill in the art to modify the structures disclosed in Hamada et al., Furuya et al, or Nakamura et al., in view of the disclosure of Hunter et al., to arrive at the claimed invention. Applicants respectfully disagree that this combination of references renders the claimed invention obvious.

Applicants respectfully submit that Hunter et al. do not teach use of an endothermic reaction catalyst as recited in the present claims. This reference teaches inclusion of a catalytic coating on *one* surface of a heat transfer membrane for catalysis of a combustion reaction, and transfer of the heat generated by the combustion reaction to a gas flowing on the other side of the

membrane (see, *e.g.*, column 1, lines 32-46). Hunter et al. discuss improvement of exothermic and endothermic reactions by using the disclosed heat exchange apparatus, but there is no teaching of exothermic and endothermic *catalysts* on opposite sides of a separator, as presently claimed. For example, in column 3, lines 29-35, this patent discloses that a catalytic coating is applied on "one side" of the ceramic coated metal separator. There is no disclosure of a second catalytic coating on the opposite side of the separator as recited in the claims of the present application. This is also reflected in the Abstract of this patent, which states that the disclosed process for catalytic heat exchange comprises providing a ceramic coated metal heat transfer membrane having two sides, "*one* of which is catalytic." (Emphasis added.) Hunter et al. discuss in column 6, lines 44-62, that exothermic and endothermic reactions may be carried out simultaneously in the disclosed heat exchange apparatus, but there is no teaching of catalysis of these reactions with endothermic and exothermic catalysts situated on opposite sides of a separator as presently claimed.

A prima facie case for obviousness requires, *inter alia*, that prior art references, when combined, must teach or suggest all claim limitations. MPEP § 2143. The cited references do not teach, either singly or in combination, an apparatus for conducting simultaneous endothermic and exothermic reactions, comprising a thin metal, heat-conductive separator with exothermic and endothermic reaction catalysts directly opposite one another on opposing sides of the separator. As stated in the Office Action, neither Hamada et al., Furuya et al., nor Nakamura et al. disclose an apparatus with a first catalyst-coated surface directly opposite a second catalyst-coated surface. The Hunter et al. reference does not supply this missing claim element. As discussed above, Hunter et al. teach an apparatus containing a combustion catalyst coating on one side of a separator, but do not teach use of an endothermic catalyst for conducting an endothermic reaction on the other side of the separator and do not teach an endothermic catalyst directly opposite the combustion catalyst as presently claimed. Thus, the cited references do not teach all of the elements of the present claims either singly or in combination, and this combination of references does not render the claimed invention obvious.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

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CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 220772007420. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: November 18, 2005

Respectfully submitted,

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